

TIP31A/31B/31C
TIP32A/32B/32C

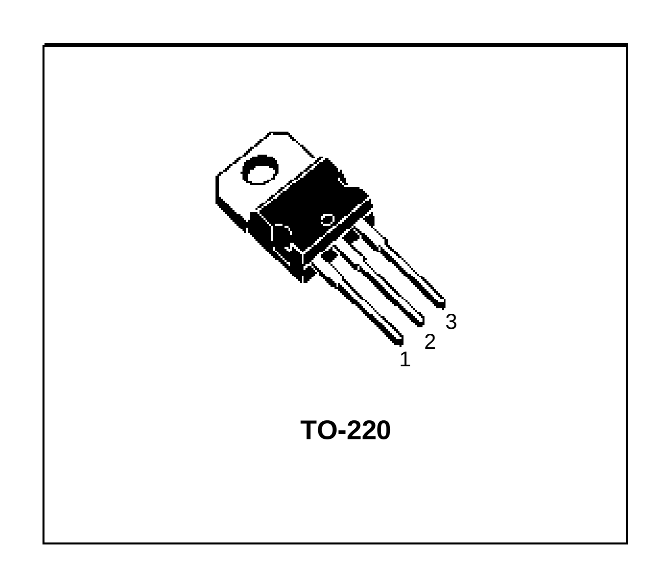
COMPLEMENTARY SILICON POWER TRANSISTORS

- TIP31A, TIP31C, TIP32A,TIP32B, AND TIP32C ARE SGS-THOMSON PREFERRED SALESTYPES

DESCRIPTION

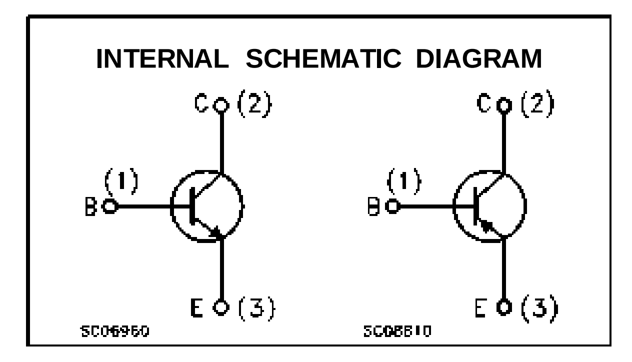
The TIP31A, TIP31B and TIP31C are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package, intented for use in medium power linear and switching applications.

The complementary PNP types are TIP32A, TIP32B and TIP32C.



TO-220

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value			Unit
		NPN	TIP31A	TIP31B	TIP31C	
		PNP	TIP32A	TIP32B	TIP32C	
V_{CBO}	Collector-Base Voltage (I_E = 0)		60	80	100	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		60	80	100	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)		5			V
I_C	Collector Current		3			A
I_{CM}	Collector Peak Current		5			A
I_B	Base Current		1			A
P_{tot}	Total Dissipation at $T_{case} \leq 25\ ^oC$ $T_{amb} \leq 25\ ^oC$		40 2			W W
T_{stg}	Storage Temperature		-65 to 150			^oC
T_j	Max. Operating Junction Temperature		150			^oC

For PNP types voltage and current values are negative.

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	3.12	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	$^oC/W$

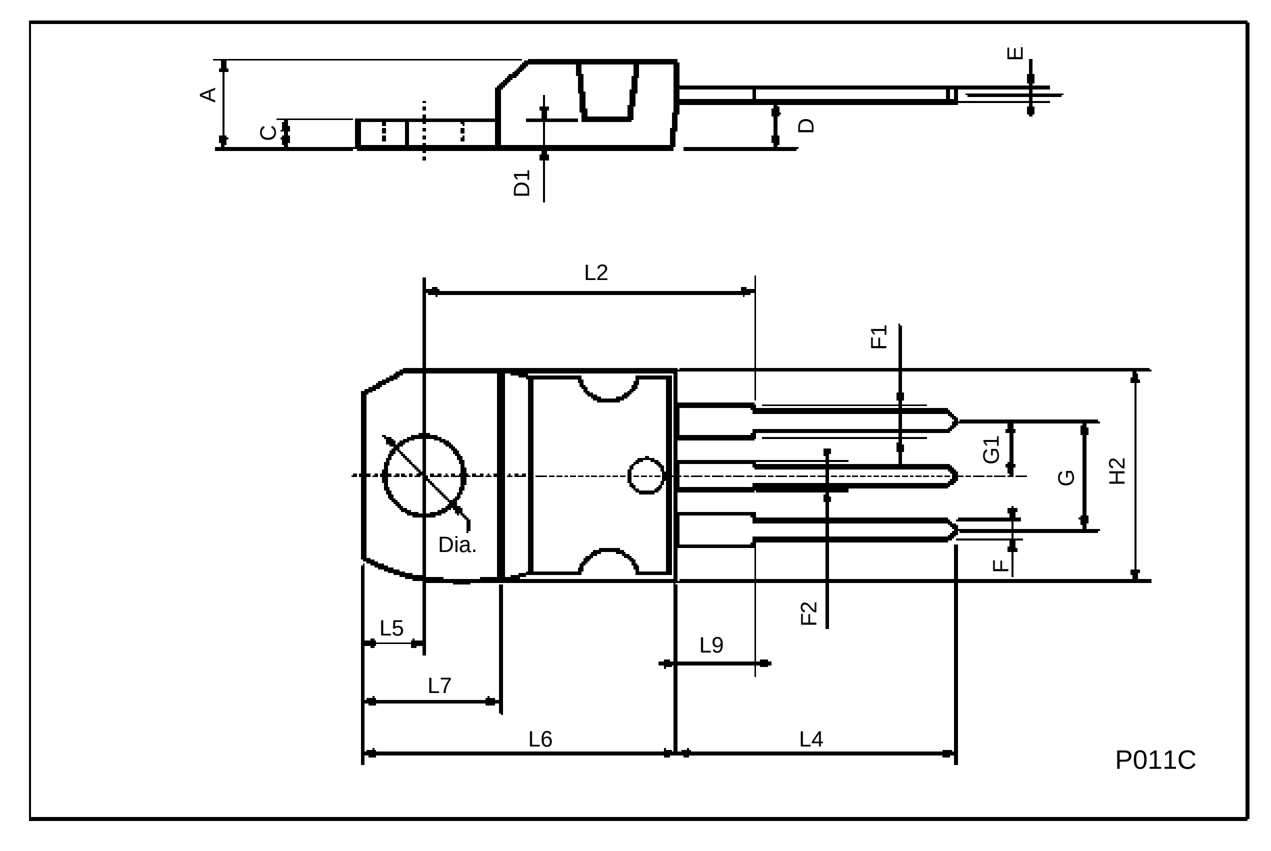
ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_B = 0)	for **TIP31A/32A** V_{CE} = 30 V for **TIP31B/31C/32B/32C** V_{CB} = 60 V			0.3 0.3	mA mA
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	for **TIP31A/32A** V_{CE} = 60 V for **TIP31B/32B** V_{CE} = 80 V for **TIP31C/32C** V_{CE} = 100 V			0.2 0.2 0.2	mA mA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 30 mA for **TIP31A/32A** for **TIP31B/32B** for **TIP31C/32C**	 60 80 100			 V V V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 3 A I_B = 375 mA			1.2	V
$V_{BE(on)}$*	Base-Emitter Voltage	I_C = 3 A V_{CE} = 4 V			1.8	V
h_{FE}*	DC Current Gain	I_C = 1 A V_{CE} = 4 V I_C = 3 A V_{CE} = 4 V	25 10		 50	
h_{fe}	Small Signal Current Gain	I_C = 0.5 A V_{CE} = 10 V f = 1 KHz I_C = 0.5 A V_{CE} = 10 V f = 1 MHz	20 3			

∗ Pulsed: Pulse duration = 300 µs, duty cycle ≤ 2 %
For PNP types voltage and current values are negative.

TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151




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MICROELECTRONICS